



## Self-righting Life Raft

During 1980's Hurricane Allen, a 30-ton yacht plying the Caribbean between Jamaica and Cuba was literally lifted out of the water and capsized by winds estimated at more than 200 miles per hour. But the four men aboard survived in a unique, high-stability, inflatable life raft which rode out the fierce winds and enormous seas for 42 hours until the group was picked up by a Norwegian tanker.

Their survival craft was a Givens Buoy Life Raft, designed and manufactured for inventor Jim Givens of Tiverton, Rhode Island by RPR Industries, Inc., Apex, North Carolina. The raft, which consists of a canopied topside and an underwater hemispheric ballast chamber, is displayed by Givens and his wife Meredith (above). The Caribbean incident was one of many in which the 75-pound raft has demonstrated its ability to withstand extremely adverse weather conditions. It is credited with saving 230 lives in the last five years.

Many seagoing vessels use inflatable life rafts as primary survival equipment. The U.S. Coast Guard requires that American-built rafts have stabilizing devices—such as water bags or “pockets”—which provide limited ballast. But the Coast Guard has acknowledged that conventional lightly-ballasted rafts can be capsized by high winds or heavy seas, possibly drowning the occupants when the inside of the raft floods.

The Givens Buoy Life Raft has a heavy ballast stabilization system which negates the capsizing problem. A “flapper valve” admits large amounts of

water to the hemisphere chamber, providing ballast to keep the center of gravity constant; the stabilization system compensates for changes in wave angle and for weight-shifting as raft occupants move about. The raft cannot overturn in normal seas; the photo below illustrates a test in which Coast Guard personnel tried to capsize the raft but could not. If a rogue wave of





exceptional strength should overturn the raft, it will somersault and right itself, as it has done repeatedly in actual survival operations.

The Givens raft is based in part on NASA technology. During the Apollo program, ocean-landed astronauts left their Command Modules and waited in inflatable rafts for pickup by helicopter. NASA found that improperly-ballasted flat bottom rafts tended to overturn under the force of the helicopter's downwash. So Johnson Space Center developed a new method of raft stabilization for which NASA secured a patent. Working independently, Jim Givens developed a very similar system. He patented his own invention and obtained an exclusive patent license for use of the NASA technology.

Produced in various sizes, the Givens Buoy Life Raft has capacities ranging from six to 20 persons. The raft is housed in a canister, available in several configurations for compact stowage aboard different types of vessels; two box-like canisters are shown above and two "low profile" versions for yachts are pictured at right. A pull on a line triggers the automatic inflation process. Inflation snaps the canister's bands, the dual buoyancy chambers inflate and the self-erecting canopy covers the raft's topside. The whole process takes 12 seconds.

The Givens raft has found wide acceptance among operators of fishing boats, pleasure craft and other vessels; some 6,000 rafts are in worldwide use. The Coast Guard is purchasing Givens rafts for use on its rescue helicopters and the Navy has a development program to adapt the system. Last year, the Coast Guard announced a proposed amendment to its regulations that would require large ballast chambers on all inflatable life rafts.

